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ABSTRACT

A study investigated whether college environments known to provide unusually rich out-of-class learning opportunities are associated with different patterns of student learning and personal development. Data were gathered during a year-long examination of institutional conditions associated with student involvement in out-of-class learning opportunities at 14 colleges and universities (Iowa State University; Miami University, Ohio; Stanford University, California; University of California-Davis; Berea College, Kentucky; Earlham College, Indiana; Grinnell College, Iowa; Evergreen State College, Washington; University of Alabama--Birmingham; University of Louisville, Kentucky; University of North Carolina-Charlotte; Wichita State University, Kansas; Mount Holyoke College, Massachusetts; and Xavier University of Louisiana) of three types: small residential, large residential, and urban. About 1,300 staff, alumni, and trustees were interviewed and 3,603 undergraduate students were surveyed. Four conclusions are drawn: (1) the small residential college environments were associated with patterns of student learning that differed appreciably from both types of larger institution; (2) for students at large institutions, one's peers seem to be as important to student learning as faculty; (3) a cumulative index of learning obfuscates the diverse patterns of learning and the influence of different environmental characteristics on learning; and (4) surrogate indices of institutional culture seem to be associated with student learning but in ways that are difficult to explain. Includes 33 references. (MSE)

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Influence of Collegiate Environments on Student Learning

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This paper was presented at the annual meeting of the Association for the Study of Higher Education held at the Red Lion-Jantzen Beach in Portland, Oregon, November 1-4, 1990. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

Influence of Collegiate Environments on Student Learning

Student learning in college occurs through associations with others (e.g., peers, faculty) in such settings as classrooms, athletic and recreational facilities, libraries, student residences, laboratories, fine arts facilities, and campus unions (Pace, 1988). These settings can be described in various ways: physical properties including the use of open space and the size, location, and use of buildings (Gerber, 1989); the ambience created by the behavior and personalities of students (Astin & Holland, 1961); the perceptions of students (Pace, 1984); the environmental "press" (Stern, 1970) or expectations established by dominant student (Clark & Trow, 1966) or faculty groups; and the cultural elements of campus life consisting of patterns of norms, practices, symbols, values, beliefs, and assumptions that guide the behavior of individuals and groups (Kuh & Whitt, 1988). Hence, collegiate environments have important objective, physical characteristics as well as important subjectively perceived and experienced qualities (Baird, 1988; Huebner, 1979; Western Interstate Commission for Higher Education, 1973).

A core assumption of ecological psychology is that people both shape their environment and are shaped by it (Banning, 1975; Barker, 1963; Kaiser, 1972; Wicker, 1979). Social learning theory (Bandura, 1977) suggests that people vary their behavior according to reinforcement consequences in their social and physical environments (Moos, 1976). Because environmental stimuli consistently elicit and reinforce certain behaviors, people tend to exhibit consistent patterns of behavior in particular settings (Barker, 1968).

Of course, the characteristics of collegiate environments are not monolithic. Baird (1990) found that students at selective liberal arts colleges, on average, reported higher levels of involvement in different

learning activities compared with their counterparts at other types of institutions (general liberal arts colleges, comprehensive universities, doctoral universities). Pace's (1988) analysis of College Student Experience Questionnaire (CSEQ) data demonstrated that variation **within** categories of colleges (e.g., selective liberal arts, research universities) may be greater than **between** categories. That is, students at some selective liberal arts colleges are more involved in learning activities than peers at other selective colleges.

One could assume that differences in student behavior across colleges and universities may be, in part, a function of how college environments are arranged. Indeed, the ecological perspective on environments coupled with the college outcomes literature (e.g., Astin, 1977; Feldman & Newcomb, 1969) suggest that some colleges may discourage students from taking advantage of learning opportunities while other institutions may be more potent in clarifying and expressing their educational purposes, shaping desired behavior, and fostering interactions among people who are basically supportive of the institution's purposes (Baird, 1988). The institutions that participated in the College Experiences Study (Kuh, Schuh, Whitt, Andreas, Lyons, Strange, Krehbiel & MacKay, 1991) are examples of the latter.[1] Students at these colleges provide a counterpoint to Baird's (1990) observation that the undergraduate experience for many students is "a rather prosaic, uninvolved affair" (p. 277).

Most of the studies that have examined the relationship between student learning and college environments employed pencil and paper instruments. For example, the aformentioned CSEQ provides useful measures of the campus environment, student learning, and the amount of effort students expend in various activities. However, as with all standardized pencil and paper

instruments, the information obtained is limited by the nature and scope of the questions. The Kuh et al. (1991) study is based on information gathered using qualitative methods. Such methods usually allow students, faculty and others to identify aspects of institutional life that they consider to be meaningful and important and produce dense, complicated descriptions of campus environments and institutional cultures. However, a limitation of the Kuh et al. project is that they did not report what or how much students learned or whether certain environmental characteristics were associated with different outcomes or patterns of student learning. Knowledge about how institutional environments known to be relatively potent in their impact on students affect student learning should be useful for policy makers as well as faculty, staff and students committed to improving the quality of undergraduate education.

Purpose

The primary purpose of this paper is to determine whether collegiate environments known to provide unusually rich out-of-class learning opportunities are associated with different patterns of student learning and personal development. That is, are certain institutional characteristics (e.g., location and emphasis on scholarship, interpersonal relations or student responsibility) associated with different patterns of student-reported learning?

Student learning is a value-added measure as it reflects students' self-reported **gains** in learning and personal development. Although student effort is known to be an important variable in learning outcomes (Astin, 1985; Pace, 1988), effort (involvement) is not introduced into the analysis because the interactions of environments, student effort and student learning are too complex to be addressed in a paper of this length. We acknowledge that student effort must also be considered to reach a more comprehensive

understanding of how environmental conditions interacting with individual student variables (e.g., ability, effort) influence learning. In a subsequent paper we shall attempt to estimate the relationships between institutional environments, student effort and student learning.

A secondary purpose of the paper is to determine whether cultural aspects of colleges and universities, discovered using qualitative methods, can enhance understanding of environmental influences on learning. That is, does information about campus culture add to the explanatory power of the influence of the environment on student learning? Combining qualitative data about institutional culture with quantitative measures of student learning presents challenges. Transforming qualitative information into quantitative indices is viewed as abhorrent by some (many?!?) for several reasons: (a) it attempts to join two inquiry paradigms some believe to be disjunct (Clark, 1985); (b) it does violence to the assumptions on which the original qualitative data collection was based; (c) it assumes that rich, complex, context-bound descriptions of complicated cultural elements of campus life can be reduced to to simple numerical indices.

Combining qualitative and quantitative methods (and their paradigms) is too complicated an issue to address here. We are certainly aware of the debate (Howe, 1988; Lincoln, 1986; Smith & Heshusius, 1986) and that support can be found for either position (assuming that only two positions are pertinent to make the point); that is, qualitative methods are grounded in a constructionist paradigm (Lincoln & Guba, 1989) while conventional quantitative methods are rooted in the agri-botany model of data collection and analysis. Our purpose here is simply to see whether some of the information obtained through qualitative methods can be used successfully to better understand aspects of the environment (e.g., culture) that cannot be

(or have not been) estimated using quantitative techniques (Jick, 1979). In addition, we expect that interpretations of the quantitative results of student learning and environmental characteristics from the CSEQ can be enriched by the contextual knowledge obtained through spending time on the campuses.

Methods

The information on which this paper is based was gathered under the auspices of the College Experience Study, a year-long investigation of the institutional conditions associated with student involvement in out-of-class learning opportunities at 14 colleges and universities (Kuh et al., 1991).

Data Sources

Participating institutions were identified with the assistance of 48 experts drawn from higher education scholars (e.g., Alexander Astin, Zelda Gamson, Robert Pace, David Riesman), higher education associations (e.g., American Association for Higher Education, American Council on Education, Council of Independent Colleges), regional accreditation associations, selected college and university presidents, and former presidents of the American College Personnel Association and the National Association of Student Personnel Administrators. The study included large universities (Iowa State University, Miami University, Stanford University, University of California, Davis), small liberal arts colleges (Berea College, Earlham College, Grinnell College, The Evergreen State College), and urban institutions (University of Alabama-Birmingham, University of Louisville, University of North Carolina-Charlotte, Wichita State University). A women's college (Mount Holyoke College) and a historically black college (Xavier University) were also studied.

Data Collection

As alluded to earlier, both qualitative and quantitative methods were

employed. Qualitative methods (i.e., interviews, observations, document analysis) were used to discover and describe the institutions' culture and subcultures as well as other aspects of institutional life thought to be related to student learning (e.g., mission and philosophy). About 1300 people (175 faculty, 83 academic administrators including presidents, chief academic officers and registrars, 305 student affairs professionals, 644 students, and 73 others such as alumni, trustees, librarians, and staff) were interviewed, some of them more than once. A detailed description of the qualitative methods employed is presented in Whitt and Kuh (in press).

In addition to the qualitative data collection activities, the College Student Experience Questionnaire (CSEQ) was administered to 9445 randomly selected undergraduate students at 13 of the 14 institutions. Students at The Evergreen State College routinely object to, and in this case, refused to participate because they believe standardized instruments are not able to capture some of the more important dimensions of their education. Some universities have found that students of color tend to complete questionnaire surveys at lower rates than white students (Amos, 1990). Hence, oversampling of minority students was requested in order to increase the number of students of color among respondents. All the institutions but Xavier were asked to oversample students of color by a factor of two. In other words, if the student body included 6% students of color, the sample drawn to receive the CSEQ reflected 12% students of color.

Usable CSEQs were returned by 3603 students. The response rate to the CSEQ (38%, Table 1), although lower than desired, is not unusual for survey instruments of this type. In addition to oversampling students of color, the participation rate was further depressed by the inclusion of four urban institutions in the study. Only 31% of the students at urban universities

responded; this low rate of return can be attributed in part to the fact that few students at these institutions live on campus; most are older than 25, attend college part time, commute to class, and have many other activities (e.g., job, family, community responsibilites) that compete with responding to surveys. Also, student participation in survey research is notoriously low at Stanford, a condition to which we were alerted prior to the distribution of instruments. For example, responses to the annual Stanford Senior Survey, an activity to which the Stanford administration devotes considerable effort, yields only about 30% annually. In any event, because the CSEQ data will be used in concert with the institutional case reports based on the qualitative data, 3600 cases were deemed sufficient to examine the influence of the environment on patterns of student learning.

Independent Variables. Two assessments of institutional environments were employed. The first is a measure of student perceptions produced by the eight CSEQ College Environment Scales which describe various characteristics of college environments (Appendix A). These are seven-point rating scales, with "7" defined as "strong emphasis" and "1" as "weak emphasis." Five of the rating scales refer to the extent to which the environment emphasizes certain aspects of student learning (scholarship, estheticism, critical/ analytical thinking, vocational competence, practical relevance of courses). The remaining three scales refer to relationships among students, faculty, and administrators. Positive relationships are defined by such words as friendly, supportive; approachable, helpful; considerate, flexible; the negative end is defined by such words as uninvolved, alienated; remote, unsympathetic; rigid, impersonal.

As mentioned earlier, the characteristics of collegiate environments differ by such types of institutions as single-purpose liberal arts colleges and research universities. To produce the best models, data from the CSEQ

Environment Scales were analyzed by the three institutional types studied: small residential (fewer than 5,000 students); large residential (5,000 or more students); and urban (institutions located in metropolitan settings with a high proportion of part time and commuting students).

The second measure of the environment was developed from Kuh et al. (1991) including the unpublished institutional reports for each of the 13 institutions in the College Experiences Study that administered the CSEQ (Evergreen State excluded). The reports describe in varying detail the physical setting, campus culture (including history and traditions), policies and practices, and the role of institutional agents in promoting student learning. Six surrogate or "dummy" variables were derived from the qualitative data:

(a) location--either "perceived" (e.g., Miami) or real isolation (e.g., Grinnell) (coded 1), near a metropolitan area (2), or city-based (i.e., the urban universities (3);

(b) status--absence of status distinctions within the student body and between faculty and students (e.g., everyone is addressed by their first name, no fraternities on campus) (coded 1), the existence of status distinctions (e.g., fraternities are present but are not the dominant student subculture) (2), or an emphasis on status (e.g., persons are almost always addressed using titles, fraternity and other social groups tend to dominate) (3);

(c) ethos--egalitarian (e.g., an emphasis on collaborative learning) (coded 1), aspects of both egalitarianism and meritocracy (2), or meritocratic (e.g., an emphasis on competitive behavior) (3);

(d) student life philosophy--autonomous (e.g., students are expected to be responsible and self-directed) (coded 1), somehat structured (2), and very

structured (e.g., numerous rules and regulations governing student life imposed by the institution) (3);

(e) strength of the institutional culture--weak (e.g., relatively few pervasive cultural values and norms) (coded 1), medium (2), and strong (e.g., numerous traditions, ceremonies, and rituals as well as binding behavioral norms) (3); and

(f) enacted (not merely espoused) commitment to multiculturalism--low (e.g., issues related to diversity and multiculturalism are not emphasized in the enacted mission, philosophy, policies and practices (coded 1), medium (2), and high (e.g., numerous references to multiculturalism by institutional leaders undergrided by such policies and practices as the presence of ethnic theme houses or culture centers and institutional financial aid targeted for students of color and other historically underrepresented groups) (3).

In Table 2 the surrogate variable values for each institution are displayed.

Dependent Variables. The 21 Estimate of Gains scales from the CSEQ consist of student ratings of progress toward important educational goals (Appendix B). According to Pace (1988), these goals are frequently mentioned in the higher education literature and have been used in national surveys over the past several decades. The instructions for this section of the CSEQ are as follows: "In thinking over your experiences in college up to now, to what extent do you feel you have gained or made progress in each of the follow respects?" The answers to be checked are "very little," "some," "quite a bit," or "very much."

> The question in the Estimate of Gains section . . . is a value added question. It doesn't ask students to estimate how much they have benefitted from college, or how well they can do

certain things, or how much they know. It asks how much they have gained, how much they have added to their knowledge, their intellectual skills, and to other abilities and insights as a result of their experiences in college.

. . . We know from both internal and external evidence that [students'] recall of activities and their estimates of gains are credible, and that they respond carefully and perhaps in many cases with personal interest to the content of the questionnaire. Because their responses are congruent with other judgments, and because for some goals the students may well be the only qualified judges of whether they are any different today than from what they were when they arrived, we must pay attention to what they say. (Pace, 1988, pp. 102-103)

Data Analysis

The relationships between the environment and students' self-reported gains in learning and personal development were analyzed in two ways. First, a "grand gain score" (outcome) was created by adding the scores of the 21 Estimate of Gains scales. Second, to discover patterns of student learning associated with different collegiate environments, the 21 Estimate of Gains scales had to be reduced to a wieldy number. Four factor analyses were performed for this purpose. The first factor analysis included all respondents from all 13 institutions and resulted in five factors which were, for the most part, consistent with the factors reported by Pace (1987) (Table 3). The only difference was that the five factors (personal/social--PERS & SOC; science/technology--SCI & TECH; general education, literature, arts--ED, LIT & ARTS; intellectual skills--INTEL SKL; vocational preparation--VOC PREP) were ordered somewhat differently for the institutions in this study: ED,

LIT & ARTS; PERS & SOC, INTEL SKL, and VOC PREP.

The factor analysis of gain scores by type of institution essentially reproduced the factors reported by Pace with three exceptions: (a) for large residential institutions Factors I (PERS & SOC) and II (SCI & TECH) were reversed; (b) for urban/commuter institutions Factors III (ED, LIT & ARTS) and IV (INTEL SKL) were reversed; and (c) for small residential institutions a substantially different factor solution emerged (Table 3). For example, 9 of the 21 gains scales for students at small residential colleges loaded on the first factor (personal/intellectual). The difference in the factor structures of the gains scores between small residential institutions and the other types of institutions seemed significant enough so that for the regression analysis of the influence of small residential environments on student learning the gains score factor solution for small residential institutions was used instead of the factor solution reported by Pace (1987).

Regression analyses were conducted to determine the influence of collegiate environments on student learning at the three types of institutions. Fourteen independent variables were introduced into the regression: the eight CSEQ College Environment scales (Appendix A) and the six surrogate measures derived from Kuh et al. (1991) (Table 2). Two sets of dependent measures were used: (a) the CSEQ Estimate of Gains grand gain score and (b) the factor solutions of the 21 Estimate of Gain scores for the respective type of institution (i.e., small residential, large residential, and urban/commuter) (Table 3).

Results

In general, the mean CSEQ Environmental Scale scores of the 13 institutions in this study were higher than the mean scores provided by Pace (1987) (Table 4). Hence one of the assumptions on which this study was based--that the environments of this set of colleges are different from those

at similar types of institutions--is supported by the CSEQ Environmental Scales. The exceptions include scale scores from the urban institutions which usually fell between the mean scores for doctoral and comprehensive universities and the vocational and practical scale scores for small residential colleges. Comparing the urban institutions in this study with mean scores of doctoral and comprehensive institutions provided by Pace (1987) is inappropriate; neither the doctoral university or comprehensive university categories devised by Pace include more than a handful of institutions located in metropolitan settings which have a substantial number of part-time, commuter students (P. Lehman, personal communication, April 21, 1990). The vocational and practical scale scores for small residential colleges in this study fall somewhere between the means for selective and general liberal arts colleges provided by Pace (1987). This is to be expected as one of the small residential colleges, Berea, emphasizes the value and dignity of manual labor; the college requires that all students work. As a result, the practical and vocational scale scores are somewhat higher than what might be expected.

The correlation matrix (Table 5) of Pace's environment scales and the surrogate variables suggest that they are generally independent environmental indices (i.e., not measuring the same thing). However, several of the surrogate variables are highly correlated (i.e., strength of the culture and location; ethos and status; commitment to multiculturalism and status and ethos) suggesting that these variables may be related to some underlying construct. The first two intercorrelations are easy to explain. Older institutions tend to have stronger cultures; because most urban/communter institutions are younger--or their current organizational form and mission have changed in the recent past--their cultures tend to be less distinctive

and, hence, weaker. Ethos and status seem to be measuring the same thing. The relatively high correlations between multiculturalism, status, ethos, and student life philosophy suggest that institutions characterized by egalitarism, an absence of status distinctions, and expectations for student responsibility are more likely to have an enacted commitment to multiculturalism (Tables 2 and 5).

Environmental scales from the CSEQ accounted for more of the variance in the grand gain score of students at small residential colleges and less at the larger institutions (Table 6). Although academic/scholarly/intellectual (SCH) and esthetic (ESTH) CSEQ Environment Scale scores of the institutions in this study were relatively high, these environmental features were not related to the grand gain score. The most important environment variable for all three institutional types was the critical, evaluative and analytical (CRIT) dimension. In addition, neither the vocational emphasis (VOC) at small colleges nor the relationships with administrators (ADM) at the large institutions accounted for a significant amount of the variance in student learning. Only one of the surrogate environmental variables, institutional philosophy (PHILOS), approached significance for only one type of institution--small residential colleges (i.e., the more structured the environment, the more students learned). Moreover, relationships between all the environmental scales and student learning were positive (Table 6).

However, when the factor solutions of the gains scales were used as the dependent variables, regression analysis revealed that the environments of the institutional types were associated with more diverse patterns of student learning. The amount of variance in the SCI & TECH gain factor accounted for by the environment for all three institutional types was so small (about 7-8%) that environmental effects on this factor will not be discussed.

For small residential institutions, learning outcomes were generally

consistent with the perceived influence of the environment. All but one of the CSEQ Environment Scales contributed to intellectual and personal growth (Table 7). Recall that this factor is composed of nine scales distributed among three of the five gain factors reported by Pace (1987). The diverse scales reflecting both intellectual and personal development suggest that the environments of small residential "involving colleges" are associated with an integrated, holistic pattern of student learning. Institutional philosophy had a modest influence on several gain factors (i.e., the more structured the environment, the greater the gains in health/teamwork, vocational competence, and art and literature) (Table 7).

Some of the relationships between the environments of large residential institutions and student learning were predictable, others were surprising. CSEQ Environment Scale scores were generally consistent with reported gains in learning and personal development. That is, students tended to report gains in areas emphasized by their environments (e.g., institutions perceived to emphasize development of vocational skills and competence were associated with gains in this area) (Table 8). And, as one might expect given the size of these institutions, relationships with administrators were not significantly related to student learning; relationships with students were positively related to gains in personal development. A structured campus environment (student life philosophy) was related to gains in personal development as well as intellectual development for students at the large residential institutions. For ED, LIT & ARTS, the magnitude of dependence on two of the surrogate variables was somewhat surprising. For example, student-reported gains in general education, literature and the arts appear to be most significant at institutions with an egalitarian ethos. More puzzling was the substantial association between a low enacted institutional

commitment to multiculturalism (MULTIC) and gains in general education, literature and the arts (Table 8). Because there is only one large residential institution with a low commitment to multiculturalism (Miami), it is possible that students at that institution report greater gains than their counterparts at the other large residential institutions.

The influence of urban/commuter environments on student learning was similar in some respects to those of large residential institutions (e.g., relationships between gains--particulrly PERS & SOC--and perceived emphasis on student and administrator relationships) (Table 9). The strength of the institutional culture was related to gains in personal development and in general education, literature and the arts; however, strength of the culture was not significantly related to student learning at either the small or large residential institutions. Also, expectations for student responsibility and self-direction (autonomous institutional student life philosophy) were associated with greater gains in personal development, general education and vocational competence (Table 9).

Discussion and Conclusions

Based on the findings, four conclusions are advanced with varying degrees of confidence. First, the environments of the small residential colleges in this study were associated with patterns of student learning that differed appreciably from both types of larger institutions. Many observers (e.g., Heath, 1968; Keeton, 1971) have argued that institutions of higher education are more likely to have the desired impact on student behavior and learning when they present a coherent mission and philosophy. The data from the small colleges in this study lend support to the claim that coherence of educational purposes provides clearer expectations and produces outcomes (e.g., holistic learning) consistent with these purposes.

Second, for students at large institutions, one's peers seem to be as

important to student learning in certain areas as are the faculty. While it was not surprising that relationships with students were related to gains in personal development (Tables 8 and 9), peers also influenced gains in intellectual development, general education and vocational skills. Thus, if one has a choice about where to go to college, estimating the quality of the students may be just as critical as judging the competence of the faculty.

Third, a cumulative index of learning obfuscates the diverse patterns of learning and the influence of different environmental characteristics on student learning. Use of a grand gain score (sum of the CSEQ Estimate of Gains scale scores) to assess the influence of the environment on student learning across different types of institutions should be interpreted with caution.

Fourth, surrogate indices of institutional culture seem to be associated with student learning but in ways that are difficult to explain. Part of the inability to provide tidy, convincing interpretations for why certain surrogate measures are linked to various gains in student learning is due to the simplification that results when complex cultural properties are transformed into numerical values. As we suggested earlier, it is possible that reducing complicated, holistic properties of institutional culture to a quantitative index does violence to the qualitative constructions on which descriptions of campus life are based. Also, the nuances of institutional policies and practices that reflect these surrogate cultural variables may be quite different depending on the institution's history, mission, and philosophy. For example, although both Miami and Xavier have a meritocratic ethos and use status distinctions in ways that are consistent with their espoused missions, the purpose, form and substance of institutional policies and practices differ considerably (Kuh et al., 1991). The majority of

students at Miami are from the top quarter of their high school graduating classes and have relatively high entrance test scores; many of the Xavier students--at least according to traditional indices--would not be eligible for admission to Miami. Yet, through of a series of pre-collegiate programs Xavier prepares students long before they matriculate for what will be expected of them in college enabling a higher percentage of them to obtain a degree than would be predicted by their educational backgrounds.

The surrogate measures do not correlate highly with the CSEQ Environment Scales; hence they reflect some different institutional qualities associated with learning. However, the absence of relationships between some surrogate variables and patterns of student learning warrants further examination. For example, neither strength of institutional culture nor institutional setting (e.g., isolated, city) were consistent predictors of gains in learning and personal development. One interpretation is that student learning is not limited by unalterable features such as the institution's location. Many students at urban/commuter universities do not have a choice about where they will attend college; their institution is "the only game in town." Students, faculty and administrators at urban institutions may find it reassuring that learning is just as likely to occur in those settings as in isolated settings.

It is possible that aspects of institutional culture may have an indirect influence on other variables related to student learning. For instance, the degree to which students feel connected to the institution may be associated with the amount of effort students expend in various activities related to learning. Another example is the messages sent by institutions with an egalitarian or collaborative ethos to students about the importance of working with others. In a subsequent paper, we shall attempt to determine whether indirect relationships exist between these surrogate variables and

patterns of student learning.

The special qualities shared to varying degrees by the institutions in this study may have produced misleading results. These colleges and universities were included because they provided rich out-of-class learning opportunities for their students. On one hand, this selection criterion may have attenuated somewhat the variance in the CSEQ Environment Scale scores by raising the floor (i.e., few low scores are reported which decreases the range between low and high scores in the sample). On the other hand, the surrogate variables created for the purposes of this study may have overestimated the actual variance within the sample. For example, all of the residential colleges and universities had more or less distinctive cultures. While some cultures of the institutions in this study may be "stronger" than others, the qualitative differences may not be as great as is suggested by surrogate variable values. Hence, some aspects of the learning environments of these institutions may appear to be more different than they actually are.

Taken together, descriptions of institutional life created from the words of students, faculty and staff and results from the CSEQ provide a rich set of data pertaining to the undergraduate student experience. Anomalies in relationships between CSEQ Estimate of Gain scores and environmental characteristics may be better understood by an analysis of institution-specific patterns of learning outcomes coupled with information about the amount of effort students expend in activities related to the various domains. For example, the variance in gains in the science and technology domain was poorly explained by environmental variables. This finding warrants further investigation. Although combining quantitative and qualitative data presents problems, both are needed to understand the mutual shaping of student characteristics and institutional factors and conditions

that foster student learning.

End Note

1

Five categories of institutional factors and conditions were reported by Kuh et al. (1991) to be common to institutions reputed to provide high quality out-of-class learning opportunities for undergraduates: (a) a clear, coherent mission and philosophy that communicate high but reasonable, challenges for students buttressed by an ethic of care; (b) institutional physical properties that are organized according to human scale principles and use the location (rural, near a city, surrounded by a metropolitan area) to educational advantage; (c) a complicated web of cultural artifacts (history, myths, sagas, heroes/heroines, traditions, rites and rituals, subcultures, institution-specific language) (Kuh & Whitt, 1988) that values and encourages learning and communicates to students "how the institution works"; (d) policies and practices that hold students responsible for their own behavior and learning, blur the artificial boundaries between in-class and out-of-class learning opportunities, distribute resources consistent with the institution's educational purposes, and enable sub-communities of students to flourish, such as fraternities, ethnic theme houses, and academic theme houses; and (e) institutional agents who promote student participation in educationally purposeful out-of-class learning activities.

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TABLE 1

Selected Demographic Information About Respondents to the College Student Experience Questionnaire

School	Sample N	Number of Respondents	Response Rate (%)	Sex (%)		Race (%)[a]					Class (%)			
				M	F	C	B	H	A	O	F	S	J	S
UA-B	748	316	42.3	36	64	80	16	1	3	1	18	15	24	44
Stanford[b]	690	192	27.8	45	55	55	6	9	24	6	62	21	15	2
UC, Davis	1486	725	48.8	39	61	42	14	22	16	5	22	23	24	30
Earlham	400	85	21.3	37	63	94	2	1	1	1	35	22	27	17
Grinnell	605	264	41.8	47	53	83	3	2	9	4	16	51	17	16
Iowa State	994	270	27.2	53	47	96	1	0	3	0	17	20	26	37
Wichita State	934	209	22.4	34	66	86	10	1	2	1	17	14	34	34
Berea	398	236	59.3	36	64	80	15	1	3	1	31	20	22	26
Louisville	965	317	31.7	36	64	86	10	1	3	1	20	21	33	26
Mount Holyoke	396	180	45.5	0	100	87	2	3	7	1	23	27	22	28
UNCC	750	201	26.8	36	64	85	12	2	0	1	23	21	28	29
Miami Univ.	1000	538	53.8	34	66	92	2	2	3	1	30	24	22	25
Xavier Univ.[c]	120	68	34.0	37	63	3	92	0	0	5	49	30	13	8
TOTALS	9486	3601	38.0	37	63	75	10	6	7	2	25	23	24	27

Legend for Table 1

[a] Race: C (caucasion), B (black, African-American), H (Hispanic, Latino, Mexican-American), A (Asian-American), O (other)

[b] Stanford: Stanford annually administers a Senior Survey. Because the Senior Survey was to be distributed near the end of the Spring Quarter, at about the same time as the CSEQ, it was agreed that seniors would not be sent the CSEQ.

[c] Xavier: The Xavier sample was a convenience sample. Originally, a random sample of Xavier students were sent the CSEQ similar to the manner in which the instruments were distributed on the other campuses. However, the returned instruments were misplaced. Xavier officials, well-intentioned, distributed additional copies of the CSEQ to selected students. The number of instruments distributed the second time (200) is an estimate.

TABLE 2
SURROGATE VARIABLES

	Strength	Location	Status	Ethos	Philos	Multic
1. Alabama	1	3	3	2	2	2
2. Stanford	2	2	2	1	1	3
3. Cal-Davis	2	2	2	2	2	3
4. Earlham	3	2	1	1	1	2
5. Grinnell	3	1	1	1	1	3
6. Iowa State	2	2	2	3	2	2
7. Wichita State	2	3	2	2	2	2
8. Berea	3	1	1	1	3	3
9. Louisville	1	3	2	2	2	2
10. Holyoke	3	1	1	1	2	2
11. UNCC	1	3	3	2	2	1
12. Miami	3	1	3	3	3	1
13. Xavier	3	3	3	3	3	3

TABLE 3

FACTOR LOADINGS OF
ESTIMATE OF GAINS SCALES

	PACE (1987) N = 2543		ALL CASES N= 3354		SMALL RESIDENTIAL N = 724	
FACTOR I	SELF	(.82)	LIT	(.81)	SYNTH	(.74)
(PERS & SOC)	OTHERS	(.77)	ARTS	(.69)	INQ	(.67)
	VALUES	(.69)	PHILS	(.64)	VALUES	(.64)
	TEAM	(.54)	GENLED	(.60)	SELF	(.63)
	HEALTH	(.50)	WRITE	(.56)	PHILS	(.63)
					ANALY	(.60)
					WRITE	(.58)
					OTHERS	(.57)
					GENLED	(.49)
FACTOR II	SCI/TECH	(.95)	OTHERS	(.76)	TECH	(.89)
(SCI & TECH)	SCI	(.82)	TEAM	(.74)	SCI	(.87)
	CONSQ	(.74)	SELF	(.67)	CONSQ	(.81)
			HEALTH	(.66)	QUANT	(.68)
			VALUES	(.62)		
FACTOR III	LIT	(.88)	SCI/TECH	(.90)	TEAM	(.67)
(ED, LIT & ARTS)	ARTS	(.63)	SCI	(.88)	HEALTH	(.64)
	WRITE	(.45)	CONSQ	(.81)		
	GENLED	(.38)				
	PHILS	(.37)				
FACTOR IV	ANALY	(.76)	SYNTH	(.73)	VOC	(.72)
(INTEL SKL)	SYNTH	(.69)	ANALY	(.73)	CAREER	(.67)
	QUANT	(.61)	INQ	(.64)	SPEC	(.54)
	INQ	(.40)	QUANT	(.54)	CMPTS	(.53)
			CMPTS	(.36)		
FACTOR V	VOC	(.74)	VOC	(.82)	ARTS	(.80)
(VOC PREP)	CAREER	(.64)	CAREER	(.72)	LIT	(.75)
	SPEC	(.46)	SPEC	(.61)		

TABLE 4

SUMMARY OF MEANS AND STANDARD DEVIATIONS
CSEQ COLLEGE ENVIRONMENT SCALES

	SR[a]		LR[a]		U/C[a]		DU[b]		CCU[b]		SLA[b]		GLA[b]	
	m	sd	m	sd	m	sd	m	sd	m	sd	m	sd	m	sd
SCH	6.5	0.8	5.9	1.1	5.4	1.2	5.5	1.2	5.4	1.2	6.3	0.9	5.7	1.2
ESTH	5.2	1.4	4.5	1.4	4.5	1.4	4.3	1.4	4.7	1.3	5.1	1.3	4.9	1.3
CRIT	6.0	1.1	5.4	1.2	4.9	1.3	5.0	1.3	4.9	1.2	5.9	1.1	5.0	1.3
VOC	4.1	1.8	4.6	1.5	4.7	1.5	4.7	1.4	4.8	1.4	3.6	1.6	5.0	1.4
PRAC	5.0	1.4	4.7	1.4	4.7	1.4	4.6	1.4	4.9	1.3	4.5	1.4	5.2	1.3
STU	5.9	1.2	5.4	1.4	4.9	1.6	5.2	1.5	5.5	1.3	5.5	1.3	5.7	1.3
FAC	5.9	1.1	5.0	1.4	5.0	1.5	4.8	1.4	5.3	1.3	5.8	1.1	5.7	1.2
ADM	4.6	1.5	4.2	1.6	4.0	1.7	3.9	1.7	4.4	1.6	4.5	1.5	4.9	1.6

a Institutions participating in the College Experiences Study
b From Pace (1987)

SR = Small residential institutions
LR = Large residential institutions
U/C = Urban institutions with a high proportion of commuter students
DU = Doctoral universities
CCU = Comprehensive colleges and universities
SLA = Selective liberal arts colleges
GLA = General liberal arts colleges

TABLE 5

INTERCORRELATION OF ENVIRONMENT SCALES

	SCH	ESTH	CRIT	VOC	PRAC	STU	FAC	ADM	STRENGTH	LOCATION	STATUS	ETHOS	PHILOS	MULTIC
SCH														
ESTH	.43													
CRIT	.56	.45												
VOC	.18	.29	.18											
PRAC	.34	.44	.35	.44										
STU	.29	.28	.25	.11	.30									
FAC	.35	.35	.32	.16	.37	.40								
ADM	.26	.30	.24	.17	.29	.33	.47							
STRENGTH	.29	.16	.24	-.07	.09	.22	.22	.11						
LOCATION	-.29	-.15	-.24	.08	-.06	-.23	-.20	-.11	-.89					
STATUS	-.21	-.14	-.22	.14	-.02	-.15	-.16	-.09	-.38	.36				
ETHOS	-.21	-.18	-.21	.13	-.05	-.11	-.16	-.11	-.08	.10	.75			
PHILOS	-.08	-.01	-.14	.19	.02	-.05	-.05	-.05	.26	-.24	.43	.58		
MULTIC	.14	.08	.17	-.06	-.02	.05	-.01	.10	.06	-.04	-.64	-.59	-.45	

TABLE 6

REGRESSION ANALYSIS
DEPENDENT VARIABLE: OUTCOME[1]
(BETA WEIGHTS)

	Small Residential	Large Residential	Urban/ Commuter
N	754	1685	1065
r^2	0.243	0.206	0.153
SCH	--	--	--
ESTH	--	--	--
CRIT	0.22	0.22	0.15
VOC	--	0.12	0.13
PRAC	0.18	0.10	0.07**
STU	0.06**	0.17	0.13
FAC	0.17	0.10	0.09*
ADM	0.12	--	--
STRENGTH	--	--	--
LOCATION	--	--	--
STATUS	--	--	--
ETHOS	--	--	--
PHILOS	0.06**	--	--
MULTIC	--	--	--

[1]OUTCOME = Sum (Estimate of Gains)

$p<.001$ unless otherwise indicated
* $p<.05$
** $p<0.10$

TABLE 7

SMALL RESIDENTIAL
REGRESSION ANALYSIS
GAINS FACTORS VS. COLLEGE ENVIRONMENT
(BETA WEIGHTS)

	PERSONAL/ INTELLECTUAL	SCIENCE/ TECHNOLOGY	TEAM/ HEALTH	VOCATIONAL	ARTS & LITERATURE
N	746	741	746	749	752
r^2	0.251	0.073	0.123	0.223	0.134
SCH	0.08*	----	----	----	----
ESTH	----	----	0.11*	-0.10*	0.10*
CRIT	0.25	----	----	0.11*	0.15
VOC	-0.13	0.15	0.08**	0.23	-0.14*
PRAC	0.17	0.11*	----	0.11*	0.11*
STU	0.07*	----	0.12	0.07**	----
FAC	0.14	0.10*	----	0.19	0.13
ADM	0.09*	----	0.19	----	0.12*
STRENGTH	----	----	----	----	----
LOCATION	----	----	0.07**	----	0.08*
STATUS	----	----	----	----	----
ETHOS	----	----	----	----	----
PHILOS	----	-0.11*	0.12*	0.12*	0.11*
MULTIC	----	----	----	0.18	----

p<.001 unless otherwise indicated
* p<.05
** p<0.10

Personal/ Intellectual = SYNTH & INQ & VALUES & SELF & PHILS & ANALY & WRITE & OTHERS & GENLED

Science/ Technology = SCI/TECH & SCI & CONSQ & QUANT

Team/Health = TEAM & HEALTH

Vocational = VOC & CAREER & SPEC & CMPTS

Arts & Literature = ARTS & LIT

TABLE 8

LARGE RESIDENTIAL
REGRESSION ANALYSIS
GAINS FACTORS VS. COLLEGE ENVIRONMENT
(BETA WEIGHTS)

	PERS & SOC	SCI & TECH	ED, LIT & ARTS	INTEL SKL	VOC PREP
N	1653	1677	1657	1648	1675
r^2	0.167	0.083	0.202	0.141	0.184
SCH	0.08*	----	----	----	----
ESTH	0.07*	-0.05**	0.19	----	-0.11
CRIT	0.07*	0.16	0.13	0.25	0.10
VOC	0.11	0.09	----	0.07*	0.27
PRAC	----	----	----	0.07*	0.14
STU	0.27	----	0.09	0.09	0.09
FAC	----	0.06*	0.09	0.08*	0.09
ADM	----	----	----	----	----
STRENGTH	----	----	----	----	----
LOCATION	----	----	----	----	----
STATUS	----	----	----	----	----
ETHOS	----	0.17	-0.40	----	0.15
PHILOS	0.12	----	----	0.06*	----
MULTIC	----	0.33	-0.36	----	0.09*

$p < .001$ unless otherwise indicated
* $p < .05$
** $p < 0.10$

PERS & SOC = SELF & OTHERS & VALUES & TEAM & HEALTH

SCI & TECH = SCI & SCI/TECH & CONSQ

ED, LIT & ARTS = GENLED & LIT & ARTS & WRITE & PHILS

INTEL SKL = ANALY & SYNTH & QUANT & INQ & CMPTS

VOC PREP = VOC & CAREER & SPEC

TABLE 9

URBAN/COMMUTER
REGRESSION ANALYSIS
GAINS FACTORS VS. COLLEGE ENVIRONMENT
(BETA WEIGHTS)

	PERS & SOC	SCI & TECH	ED, LIT & ARTS	INTEL SKL	VOC PREP
N	1034	1058	1049	1042	1056
r^2	0.153	0.073	0.103	0.103	0.168
SCH	----	----	----	0.08*	0.09*
ESTH	0.08*	-0.10*	0.17	-0.14	-0.08*
CRIT	----	0.18	0.09*	0.15	----
VOC	0.06**	0.13	----	0.09*	0.22
PRAC	0.09*	----	----	0.08*	0.14
STU	0.22	0.08*	----	0.09*	----
FAC	0.06**	----	0.14	0.07*	0.14
ADM	----	----	----	----	----
STRENGTH	0.16*	----	0.10*	----	----
LOCATION	----	----	----	----	----
STATUS	0.10*	0.07*	0.07**	----	----
ETHOS	----	----	----	----	----
PHILOS	-0.12*	----	-0.10**	----	-0.11*
MULTIC	----	0.06*	0.07**	----	0.10*

p<.001 unless otherwise indicated
* p<.05
** p<0.10

PERS & SOC = SELF & OTHERS & VALUES & TEAM & HEALTH

SCI & TECH = SCI & SCI/TECH & CONSQ

ED, LIT & ARTS = GENLED & LIT & ARTS & WRITE & PHILS

INTEL SKL = ANALY & SYNTH & QUANT & INQ & CMPTS

VOC PREP = VOC & CAREER & SPEC

APPENDIX A

CSEQ COLLEGE ENVIRONMENT SCALES

SCH = Emphasis on the development of academic, scholarly, and intellectual qualities.

ESTH = Emphasis on the development of esthetic, expressive, and creative qualities.

CRIT = Emphasis on being critical, evaluative, and analytical.

VOC = Emphasis on the development of vocational and occupational competency.

PRAC = Emphasis on the personal relevance and practical values of your courses.

STU = Relationships with other students, student groups, and student activities.

FAC = Relationships with faculty members.

ADM = Relationships with administration personnel and offices

APPENDIX B

CSEQ ESTIMATE OF GAINS SCALES

VOC	Vocational training--acquiring knowledge and skills applicable to a specific job or type of work.
SPEC	Acquiring background and specialization for further education in some professional, scientific, or scholarly field.
GENLED	Gaining a broad general education about different fields of knowledge.
CAREER	Gaining a range of information that may be relevant to a career.
ARTS	Developing an understanding and enjoyment of art, music, and drama.
LIT	Broadening your acquaintance and enjoyment of literature.
WRITE	Writing clearly and effectively.
CMPTS	Acquiring familiarity with the use of computers.
PHILS	Becoming aware of different philosophies, cultures, and ways of life.
VALUES	Developing your own values and ethical standards.
SELF	Understanding yourself--your abilities, interests, and personality.
OTHERS	Understanding other people and the ability to get along with different kinds of people.
TEAM	Ability to function as a team member.
HEALTH	Developing good health habits and physical fitness.
SCI	Understanding the nature of science and experimentation.
SCI/TECH	Understanding new scientific and technical developments.
CONSQ S/T	Becoming aware of the consequences (benefits/hazards/dangers/values) of new applications in science and technology.
ANALY	Ability to think analytically and logically.
QUANT	Quantitative thinking--understanding probabilities, proportions, etc.
SYNTH	Ability to put ideas together, to see relationships, similarities, and differences between ideas.
INQ	Ability to learn on your own, pursue ideas, and find information you need.